Vegetable Science (2023) 50(2): 330-337
doi: 10.61180/vegsci.2023.v50.i2.10
ISSN- 0970-6585 (Print), ISSN- 2455-7552 (Online)
www.isvsvegsci.in

RESEARCH PAPER

A study on assessing area, production and impact of vegetable varieties from ICAR-Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh, India

Govind Pal*, P.M. Singh, Shubhadeep Roy, Neeraj Singh, Anant Bahadur and T. K. Behera

Abstract

The ICAR-Indian Institute of Vegetable Research, Varanasi has released a number of varieties and hybrids that have been widely adopted and cultivated by large number of farmers throughout the country. Therefore, the present study was taken up with the objectives to estimate the area covered by the Institute varieties and assess the production and economic impact due to the adoption and spread of ICAR-IIVR varieties in the country. The area covered by ICAR- IIVR varieties in the country during 2021-22 was estimated based on the number of quality seeds provided to the farmers and different government and private agencies through various channels. The average wholesale prices of different vegetable crops was collected and computed from Agmarknet. The analysis showed that ICAR-IIVR varieties has covered about 133133 ha in the country during the year 2021-22 including 23 vegetable crops and 62 varieties. The Institute variety has spread in 161 districts in 27 states and 3 UTs in the Country. The estimated incremental gain in production due to the adoption of ICAR- IIVR vegetable varieties was 112.67 thousand tons and the incremental gain in income with ICAR- IIVR varieties was estimated to Rs. 239.41 Crores during the year 2021-22. Tomato crop has the highest contribution in incremental gain in income among ICAR- IIVR varieties followed by chili, brinjal, bottle gourd and okra. Over the years, seed demand and sale of ICAR- IIVR varieties have been increasing indicating the growing popularity of ICAR- IIVR varieties among the farmers in the country.

Keywords: Vegetables, Area, Production, Impact.

ICAR-Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh, India

*Corresponding author; Email: govind.Pal@icar.gov.in

Citation: Pal, G., Singh, P.M., Roy, S., Singh, N., Bahadur, A. and Behera, T.K. (2023). A study on assessing area, production and impact of vegetable varieties from ICAR-Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh, India. Vegetable Science 50(2): 330-337.

Source of support: Nil

Conflict of interest: None.

Received: 21/09/2023 **Revised:** 28/12/2023 **Accepted:** 29/12/2023

Introduction

Vegetable crops play an important role in the agricultural development and nutritional security of the country as it is rich source of vitamins, minerals and plant fibers. Vegetables are grown in highly diverse conditions ranging from hills to coasts. Majority of the vegetables have a short crop cycle and therefore provide income and employment around the year. Vegetable production provides a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies (Schreinemachers et al., 2018). India is bestowed with varied agro-climatic conditions, which allow the growing of several types of vegetables in the country. There is a change in the dietary pattern of people with rise in income and living standard and an increase in awareness about the quality of food. The demand for vegetables has been constantly increasing due to health consciousness. Vegetable cultivation also provide the on-farm and off-farm employment throughout the year. Vegetable crops shares around 5.43% of country's gross cropped area and 39.52% of area under horticulture crops during the year 2020-21. Vegetable sector accounts for around 2.58 per cent of Gross domestic product of the country.

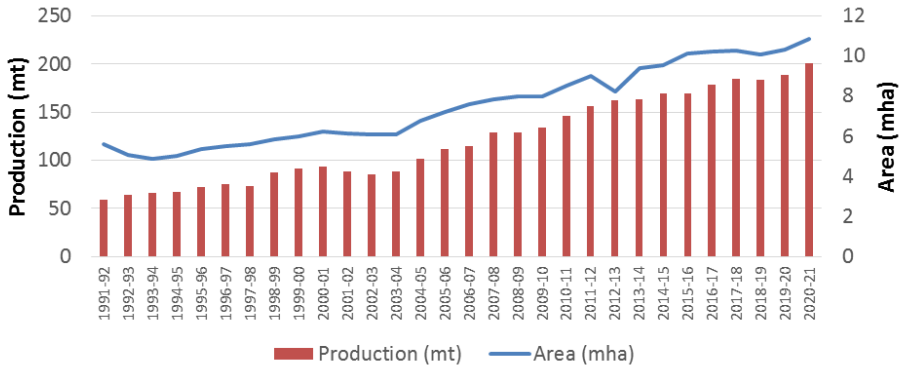

Figure 1: Trends in area and production of vegetables in India

India is the second largest producer of vegetables, next to China. India's share is 11.95% in total global production of vegetables (FAO, 2023). The production of vegetables in India is 204.84 million tonnes from area of 11.35 million hectares (DoAFW, 2023). In the world, India occupies first position in the production of okra second in potatoes, tomatoes, eggplants, green peas, cauliflowers & broccoli, cabbages, green garlic and third in lettuce & chicory (FAO, 2023). Share of vegetables export in India's total export is only 0.37%, share in export of agriculture and related products is 3.30% and share in export of horticultural products is 16.21% respectively during 2021-22 though vegetable production is more important in terms of social, nutritional, livelihood security, income and employment generation for the majority of small of marginal farmers. The area and production under vegetable crops in the country during thirty years (1991-92 to 2020-21) have been presented in Figure 1. The area under vegetable crops has increased from 5.59 mha to 10.86 mha (94.15% increase) during thirty years (1991-92 to 2020-21). Similarly, the production of vegetable crops has increased from 58.53 mt to 200.45 mt (242.45% increase) during thirty years. The productivity of vegetable crops has increased from 10.47 t/ha to 18.46 t/ha (76.31%increase) during thirty years. The increase in vegetable production is mainly due to development of improved high yielding varieties and hybrids, development of production, protection and post-harvest technologies, various infrastructure and developmental projects, efforts of farmers and policy support in the field of vegetable sector. With the increase in vegetable production, country has not only achieved almost self-sufficiency in vegetables but also produces surplus for export.

The ICAR-Indian Institute of Vegetable Research, Varanasi is a major Institute devoted to research and development on all aspects of vegetables. Since its inception, the Institute significantly contributed in the field of vegetables improvement, production, protection and extension. Number of varieties and hybrids has been released by the Institute which is widely adopted and cultivated by large number of farmers in the country. The economic impact made by the varieties developed by the Institute in particular and the sum of all the impact developed by the Institute in general provide us with the extent of contribution made towards the economy. This attracts public funding in research projects of the Institute. Apart from direct economic contributions, several intangible benefits such as increase in nutritional and livelihood security of the farmers & consumers, maintain a sustainable ecological balance through developing eco-friendly technologies contributing to social gains. The efficient resource allocation under scare resource use and the necessity to justify their use to the society require the assessment of economic impacts of research. Economic impacts of new technologies deliver helpful information to justify investment efforts in research and development to generate new technologies. Pathak et al. (2018) and Pathak et al. (2019) has estimated the area, production and return with rice varieties of NRRI, Cuttack in the country based on the amount of quality seeds provided to the farmers through various ways. Considering the importance of vegetable varieties developed by ICAR-Indian Institute of Vegetable Research, Varanasi, the present study was taken up with the objectives to estimate the area covered by the ICAR-IIVR varieties and assess the production and economic impact due to the spread of ICAR-IIVR varieties in the country.

Materials and Methods

Estimation of Area

Estimation of area under ICAR-IIVR vegetable varieties have been made based on breeder seeds and truthfully labelled seeds. The data on the quantity of breeder seeds sold to different Government and private agencies were collected and further the conversion of breeder seeds to foundation seeds and then to certified seeds/ truthfully labelled seeds was estimated considering the average yield loss (due to biotic and abiotic factors) and seed multiplication ratio of particular crop. The quantity of truthfully labelled seeds sold to farmers, different government and private agencies

were collected from the ICAR-IIVR seed sale center. The approximate area under the crop was estimated considering the seed rate of particular crop.

Production and Gross Return

Production of ICAR-IIVR vegetable varieties was calculated using the following equation.

$$\left(\begin{matrix}\text{Production of IIVR}\\ \text{varieties (t)}\end{matrix}\right) = \frac{\text{Area of IIVR varieties (ha)}}{\text{Total area under veg.crop (ha)}} \text{ X } \left(\begin{matrix}\text{Total production}\\ \text{of Veg.crop (t)}\end{matrix}\right)$$

Gross value / return with ICAR-IIVR vegetable varieties was calculated using the following equation.

$$\left(\begin{matrix}\text{Gross value of}\\ \text{IIVR varieties (Rs.)}\end{matrix}\right) = \left(\begin{matrix}\text{Production of}\\ \text{IIVR varieties (t)}\end{matrix}\right) \text{ X } \left(\begin{matrix}\text{Average wholesale}\\ \text{price of Veg.crop (Rs/Kg)}\end{matrix}\right) \text{ X } 1000$$

The average wholesale prices of different vegetable crops was collected and computed from website of Directorate of Marketing & Inspection (DMI), Ministry of Agriculture and Farmers Welfare, Government of India (https://agmarknet.gov.in).

Incremental Gains in Production and Return

Incremental gain in production due to adoption of ICAR-IIVR vegetable varieties were calculated considering 5% incremental gain because a new variety is released only when a minimum yield advantage is more than 5% than the local check variety. Thus, the incremental gain in production of ICAR-IIVR vegetable varieties was calculated using the following equation.

$$\left(\begin{matrix}\text{Gain in}\\ \text{production}\\ \text{with IIVR}\\ \text{varieties (t)}\end{matrix}\right) = \frac{\text{Area of IIVR varieties (ha)}}{\text{Total area under veg.crop (ha)}} \text{ X } \left(\begin{matrix}\text{Total production}\\ \text{of Veg.crop (t)}\end{matrix}\right) \text{ X } \frac{5}{100}$$

The incremental production was multiplied with the average wholesale prices of vegetable crops collected from https://agmarknet.gov.in to get additional return over non-IIVR varieties. Incremental gain in return with IIVR varieties was calculated using the following equation.

$$\left(\begin{matrix}\text{Gain in}\\ \text{income}\\ \text{with IIVR}\\ \text{varieties}\\ \text{(Rs.)}\end{matrix}\right) = \left(\begin{matrix}\text{Gain in}\\ \text{production}\\ \text{with IIVR}\\ \text{varieties (t)}\end{matrix}\right) \text{ X } \left(\begin{matrix}\text{average}\\ \text{wholesale}\\ \text{prices}\\ \text{of veg.crop}\\ \text{(Rs./t)}\end{matrix}\right)$$

Results and Discussion

Share of important vegetables in total vegetable production in India during Triennium Ending 2020-21 have been presented in Figure 2. The data for TE 2020-21 shows that the potato has the highest share (27.09%) followed by onion (13.21%), tomato (10.62%), brinjal (6.69 %), cabbage (4.89%), cauliflower (4.76%), okra (3.32%), tapioca (3.14%), peas (3.02%) and green chilies (2.14%) in total vegetable production. Top ten vegetables constitute around 78.89% share among total vegetable production in the country.

Share of important states in total vegetable production in India during TE 2020-21 have been presented in Figure 3. The figure shows that West Bengal has the highest share

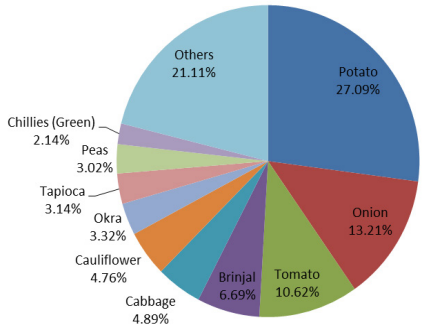

Figure 2: Share of important vegetables in total vegetable production in India during TE 2020-21

(14.93%) followed by Uttar Pradesh (14.54%), Madhya Pradesh (10.34%), Bihar (8.86%), Gujarat (6.98%), Maharashtra (6.94%), Odisha (4.65%), Karnataka (3.85%), Tamil Nadu (3.79%) and Chhattisgarh (3.69%) in total vegetable production. Top ten vegetables producing states constitute around 78.57% share among total vegetable production in the country.

Vegetable crops wise name and number of varieties and hybrids developed by ICAR- Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh and notified by Central Sub-Committee on Crop Standards Notification & Release of Varieties for Horticultural Crops at Central level and State Seed Sub-Committee (SSSC) at State level have been presented in the Table 1. The total number of varieties and hybrids notified was 102 in 27 vegetable crops up to year 2022. The total number includes 15 hybrids and 87 varieties. Highest number of notified varieties and hybrids was in okra (13) followed by tomato (10), brinjal (7), chili (7), cowpea (6), pea (6) and Sponge gourd (6).

The details of vegetable crops, varieties and estimated area coverage under varieties developed by ICAR-IIVR, Varanasi on the basis of total truthfully labelled seed sold during the year 2021-22 has been presented in the Table 2. The total truthfully labelled seed sold during the year 2021-22 was 14239.01 kg of 23 crops and 62 varieties. The total estimated area coverage (ha) under varieties developed

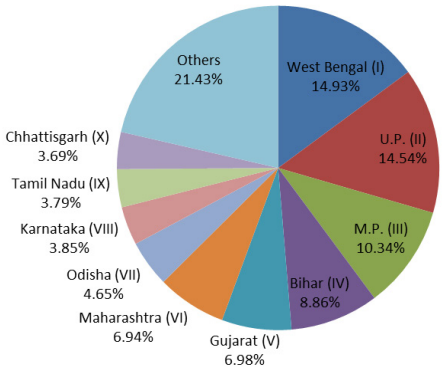

Figure 3: Share of important states in total vegetable production in India during TE 2020-21

Table 1: Vegetable varieties including hybrids developed by ICAR- IIVR, Varanasi, Uttar Pradesh

S. No.	*Crops*	*Varieties / hybrid notified*	*Number*
1	Amaranthus	Kashi Suhaavani (2019)	1
2	Ash Gourd	Kashi Dhawal (2006), Kashi Ujwal (2006), Kashi Surbhi (2014)	3
3	Basella (Poi)	Kashi Poi-1 (2019), Kashi Poi-2 (2019), Kashi Poi-3 (2019)	3
4	Bathua	Kashi Bathua-2 (2019), Kashi Bathua-4 (2019)	2
5	Bitter gourd	Kashi Mayuri (2019)	1
6	Bottle gourd	Kashi Bahar* (2006), Kashi Ganga (2006), Kashi Kiran (2019), Kashi Kirti (2019), Kashi Kundal (2019)	5
7	Brinjal	Kashi Prakash (2006), Kashi Sandesh* (2006), Kashi Taru (2006), Kashi Himani (2019), Kashi Vijay (2021), Kashi Brinjal Green (2022), Kashi Manohar* (2022)	7
8	Carrot	Kashi Arun (2022), Kashi Krishna (2019)	2
9	Cauliflower	Kashi Kunwari (2006), Kashi Aghani (2008), Kashi Gobhi-25 (2019)	3
10	Chili	Kashi Anmol (2006), Kashi Surkh* (2006), Kashi Gaurav (2012), Kashi Sinduri (2012), Kashi Abha (2019), Kashi Ratna* (2019), Kashi Tez* (2019)	7
11	Cowpea	Kashi Gouri (2006), Kashi Shyamal (2006), Kashi Kanchan (2007), Kashi Unnati (2007), Kashi Nidhi (2012), Kashi Vishan (2022)	6
12	Cucumber	Kashi Nutan* (2019),	1
13	Dolichos bean	Kashi Haritima (2012), VRBSEM-3 (2022), VRBSEM-9 (2022)	3
14	French Bean	Kashi Param (2006), Kashi Rajhans (2019), Kashi Sampann (2019), Kashi Baingani (2021), Kashi Agrim (2022)	5
15	Indian Bean	Kashi Khushhaal (2019), Kashi Sheetal (2019)	2
16	Long Melon	Kashi Santushti (2021)	1
17	Muskmelon	Kashi Madhu (2006)	1
18	Okra	Kashi Mohini (2001), Sheetla Jyoti* (2001), Sheetla Uphar* (2001), Kashi Bhairav* (2006), Kashi Lila (2006), Kashi Pragati (2006), Kashi Satdhari (2006), Kashi Vibhuti (2006), Kashi Kranti (2012), Kashi Vardaan (2015), Kashi Chaman (2019), Kashi Lalima (2019), Kashi Shrishti* (2019)	13
19	Pea	Kashi Mukti (2006), Kashi Nandini (2006), Kashi Shakti (2006), Kashi Uday (2006), Kashi Samridhi (2012), Kashi Ageti (2015),	6
20	Pointed Gourd	Kashi Alankar (2010), Kashi Suphal (2019), Kashi Amulya (2019)	3
21	Pumpkin	Kashi Harit (2006), Kashi Shishir* (2019), Kashi Basant (2022)	3
22	Radish	Kashi Hans (2006), Kashi Shweta (2006), Kashi Lohit (2019), Kashi Mooli-40 (2019), Kashi Aardra (2021)	5
23	Ridge Gourd	Kashi Shivani (2016)	1
24	Satputia	Kashi Khushi (2019)	1
25	Sponge gourd	Kashi Divya (2012), Kashi Jyoti (2019), Kashi Rakshita* (2019), Kashi Saumya* (2019), Kashi Shreya (2019), Kashi Kalyani (2022)	6
26	Summer squash	Kashi Shubhangi (2019)	1
27	Tomato	Kashi Amrit (2006), Kashi Anupam (2006), Kashi Hemant (2006), Kashi Sharad (2006), Kashi Vishesh (2006), Kashi Abhiman* (2012), Kashi Adarsh (2016), Kashi Aman (2018), Kashi Amul (2018), K. Chayan (2021),	10
Total vegetable crops- 27; Total number of varieties/hybrids- 102			

* Hybrid; Figures in parentheses is the notification year of variety / hybrid

by Institute on the basis of total truthfully labelled seed was 1435.15 ha during the year 2021-22.

The details of vegetable crops, varieties and estimated area coverage under varieties developed by ICAR-IIVR, Varanasi on the basis of breeder seed sold during the year 2021-22 has been presented in the Table 3. The total breeder seed sold during the year 2021-22 was 2709 kg of 14 crops and 29 varieties. The total estimated area coverage

Table 2: TL seed sold and estimated area coverage under varieties developed by ICAR-IIVR, Varanasi

S. No.	*Crops*	*Variety*	*TL seed sold during the years 2021-22 (kg)*	*Estimated area coverage (ha) during the years 2021-22*
1	Ash Gourd	K. Dhawal, K. Surabhi	226.89	90.76
2	Bathua	K. Bathua-2, K. Bathua-4	5.55	2.78
3	Bitter gourd	K. Mayuri	53.27	10.65
4	Bottle Gourd	K. Ganga, K. Kirti, K. Kundal, K. Kiran	248.82	62.21
5	Brinjal	K. Taru, K. Uttam	45.14	90.28
6	Brinjal Hybrid	K. Sandesh	21.18	84.72
7	Carrot	K. Krishna, K. Arun	123.68	20.61
8	Cauliflower	K. Gobhi-25	61.62	154.05
9	Chili	K. Anmol, K. Gaurav, K. Abha	130.09	216.82
10	Chili Hybrid	K Ratna, K. Tej	2.08	5.20
11	Cowpea	K. Kanchan, K. Nidhi, K. Gouri	3361.61	168.08
12	Cucumber Hybrid	K. Nutan	4.09	4.09
13	French bean	K. Sampann, K. Rajhans	200.65	5.02
14	Indian bean	K. Khushahal, K. Haritima, K. Shital	48.15	2.41
15	Musk Melon	K. Madhu	0.05	0.02
16	Okra	K. Pragati, K. Kranti, K. Lalima, K. Chaman	987.34	82.28
17	Palak	K. Baramasi	12.10	0.48
18	Pea	K. Uday, K. Nandini, K. Mukti, K. Samridhi, K. Ageti	7644.05	50.96
19	Pointed Gourd	K. Alankar (Sapling)	306.00	0.03
20	Pumpkin	K. Harit	98.78	24.70
21	Radish	K. Hans, K. Lohit, K. Mooli-40, K. Shweta, K. Ardra	282.52	47.09
22	Ridge gourd	K. Shivani, K. Khushi	85.82	21.46
23	Sponge Gourd	K. Shreya, K. Jyoti, K. Divya	180.07	45.02
24	Sponge Gourd Hybrid	K. Rakshita, K. Soumya	9.35	3.74
25	Summer Squash	K. Shubhangi	6.88	2.29
26	Tomato	K. Aman, K. Vishesh, K. Amrit, K. Adarsh, K. Chayan	90.69	226.73
27	Tomato Hybrid	K. Abhiman	2.54	12.70
Total (Crops- 23)		Varieties- 62	14239.01	1435.15

(ha) under varieties developed by Institute on the basis of breeder seed was 131698.00 ha during the year 2021-22.

Total estimated area coverage under varieties developed by ICAR-IIVR, Varanasi on the basis of both total truthfully labelled and breeder seed sold during the year 2021-22 has been presented in the Table 4. The total estimated area coverage (ha) under varieties developed by Institute was 133133.15 ha during the year 2021-22. The total number of crops was 23 and the varieties were 62. The Institute variety seed has spread in 161 districts in 27 states and 3 UTs in the Country. Among different vegetable crops of Institute varieties tomato has the highest area followed by chili, brinjal, bottle gourd, okra, radish, cowpea, pea, pumpkin, sponge gourd, ash gourd, muskmelon, bitter gourd, carrot and other vegetable crops.

Impact in terms of monetary gain of varieties developed by ICAR- IIVR, Varanasi including incremental gain in production and income with ICAR- IIVR varieties has been presented in the Table 5. The total estimated production of ICAR- IIVR varieties was 2253.43 thousand tons. The estimated incremental gain in production due to adoption of ICAR- IIVR vegetable varieties was 112.67 thousand tons

Table 3: Breeder seed sold and estimated area coverage under varieties developed by ICAR-IIVR, Varanasi

S. No.	*Crops*	*Variety*	*Breeder seed sold during the years 2021-22 (kg)*	*Estimated area coverage (ha) during the years 2021-22*
1	Ash Gourd	K. Dhawal	1.00	360.00
2	Bitter Gourd	K. Mayuri	2.00	160.00
3	Bottle Gourd	K. Ganga, K. Kirti	40.00	16000.00
4	Brinjal	K. Taru	0.75	23438.00
5	Carrot	K. Krishna	0.50	133.00
6	Chili	K. Anmol, K. Gaurav, K. Abha	5.50	33000.00
7	Cowpea	K. Kanchan, K. Nidhi, K. Gouri	161.50	3230.00
8	Muskmelon	K. Madhu	1.00	250.00
9	Okra	K. Pragati, K. Kranti, K. Lalima, K. Chaman	182.00	9479.00
10	Pumpkin	K. Harit	2.00	1250.00
11	Radish	K. Hans, K. Lohit, K. Mooli 40	10.25	4271.00
12	Sponge Gourd	K. Shreya, K. Jyoti, K. Divya	11.0	1100.00
13	Tomato	K. Vishesh, K. Adarsh	1.50	37500.00
14	Vegetable Pea	K. Uday, K. Nandini, K. Mukti	2290.00	1527.00
Total (14)		Varieties- 29	2709.00	131698.00

Table 4: Total estimated area coverage under varieties developed by ICAR-IIVR, Varanasi

S. No.	*Crops*	*Variety*	*Estimated area coverage (ha) during the years 2021-22*
1	Ash Gourd	K. Dhawal, K. Surabhi	450.76
2	Bitter Gourd	K. Mayuri	170.65
3	Bottle Gourd	K. Ganga, K. Kirti, K. Kundal, K. Kiran	16062.21
4	Brinjal	K. Taru, K. Uttam, K. Sandesh	23612.50
5	Carrot	K. Krishna, K. Arun	153.95
6	Chili	K. Anmol, K. Gaurav, K. Abha, K. Ratna, K. Tej	33222.02
7	Cowpea	K. Kanchan, K. Nidhi, K. Gouri	3398.08
8	Muskmelon	K. Madhu	250.02
9	Okra	K. Pragati, K. Kranti, K. Lalima, K. Chaman	9561.28
10	Pumpkin	K. Harit	1274.70
11	Radish	K. Hans, K. Lohit, K. Mooli 40, K. Shweta, K. Ardra	4317.92
12	Sponge Gourd	K. Shreya, K. Jyoti, K. Divya, K. Rakshita, K. Soumya	1148.76
13	Tomato	K. Aman, K. Vishesh, K. Amrit, K. Adarsh, K. Chayan, K. Abhiman	37739.43
14	Vegetable Pea	K. Uday, K. Nandini, K. Mukti, K. Samridhi, K. Ageti	1577.63
15	Others crops	-	193.24
Total		Crops- 23, Varieties- 62	133133.15

Table 5: Impact in terms of monetary gain of varieties developed by ICAR-IIVR, Varanasi

S. No.	*Crops*	*Average area under IIVR varieties (ha)*	*Production of IIVR varieties (000 t)*	*Incremental gain in production with IIVR varieties (000 t)*	*Gross value of IIVR varieties (Rs. Crores)*	*Incremental gain in income with IIVR varieties (Rs. Crores)*
1	Ash Gourd	450.76	13.52	0.68	23.88	1.19
2	Bitter Gourd	170.65	2.06	0.10	5.52	0.28
3	Bottle Gourd	16062.21	262.19	13.11	342.16	17.11
4	Brinjal	23612.5	406.69	20.33	747.09	37.35
5	Carrot	153.95	2.68	0.13	6.75	0.34
6	Chili	33222.02	346.78	17.34	1195.01	59.75
7	Cowpea	3398.08	33.98	1.70	117.47	5.87
8	Muskmelon	250.02	2.50	0.13	6.15	0.31
9	Okra	9561.28	116.06	5.80	320.79	16.04
10	Pumpkin	1274.7	26.97	1.35	34.11	1.71
11	Radish	4317.92	67.44	3.37	71.56	3.58
12	Sponge Gourd	1148.76	14.93	0.75	30.60	1.53
13	Tomato	37739.43	937.90	46.89	1803.57	90.18
14	Vegetable Pea	1577.63	16.14	0.81	72.57	3.63
15	Others	193.24	3.59	0.18	10.96	0.55
Total		133133.15	2253.43	112.67	4788.19	239.41

and the incremental gain in income with ICAR- IIVR varieties was estimated to Rs. 239.41 Crores during the year 2021-22. Tomato crop has the highest contribution in incremental gain in income with ICAR- IIVR varieties followed by chili, brinjal, bottle gourd and okra. Top five vegetable crops constitute around 92.07 per cent share in total incremental gain in income with ICAR- IIVR varieties.

Conclusion

The economic impact made by the varieties developed by the Institute in particular and the sum of all the impact developed by the Institute in general provide us the extent of contribution made towards the economy. This attracts public funding in research projects of the Institute. Among Institute mandated important vegetable crops tomato has the highest share in total vegetable production followed by brinjal, cabbage, cauliflower, okra, peas and green chilies. The total truthfully labelled seed sold during the year 2021-22 was 14239.01 Kg. of 23 crops and 62 varieties covering area of 1435.15 ha. Similarly, total breeder seed sold during the year 2021-22 was 2709 Kg. of 14 crops and 29 varieties covering estimated area of 131698.00 ha during the year 2021-22. The total estimated area coverage (ha) under varieties developed by Institute was 133133.15 ha during the year 2021-22. The total incremental gain in income with all ICAR- IIVR varieties was estimated to Rs. 239.41 Crores during the year 2021-22. Adoption of ICAR- IIVR varieties by the farmers has resulted in increasing vegetable production as well as economic upliftment of the farming community.

References

DoAFW (2023). Area and Production of Horticulture crops for 2021-22 (3rd Advance Estimates). Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India. (Available: http:// https://agricoop.nic.in/).

FAO (2023). FAOSTAT Statistical Database 2021. Food and Agricultural Organization of the United Nations, Rome. (Available: http://www.fao.org/faostat/en/#data).

Pal, G., Roy, S., Singh, N., Singh, P.M., Yerasu, S.R., Yadava, R.B., Behera, T.K. (2023).A study on economic impact assessment of tomato var. Kashi Aman using the economic surplus model. Vegetable Science 50 (1), 46-51.

Pathak H., Pradhan. S.K., Parameswaran, C., Mondal, B., Jambhulkar, N.N., Tripathi, R., Chakraborti, M., Kumar, G.A.K., Samal, P. and Sahu, R.K. (2018). Contributions of NRRI Rice Varieties to National Food Security. NRRI Research Bulletin No. 16, ICAR-National Rice Research Institute, Cuttack, Odisha, 753006, India. pp 26+vi.

Pathak, H., Pradhan, S.K., Mondal, B., Jambhulkar, N.N., Parameswaran, C., Tripathi, R., Chakraborti, M., Kumar, G.A.K., Samal, P. and Sahu, R.K. (2019). Assessing area, production and return with rice varieties of NRRI, Cuttack. Oryza, 56 (Special Issue), 169-173.

Schreinemachers, P., Simmons, E.B. and Wopereis, M.C.S. (2018). Tapping the economic and nutritional power of vegetables. Global Food Security, 16, 36-45.

सारांश

भा.कृ.अनु.प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी ने सब्जियों की कई किस्मों और संकरों को विकसित किया है जिसे पूरे देष में बड़ी संख्या में किसानों द्वारा अपनाया गया है। अतः वर्तमान अध्ययन संस्थान की किस्मों द्वारा आच्छादित क्षेत्र का अनुमान लगाने और इन किस्मों के कारण उत्पादन एवं आर्थिक प्रभाव का आकलन करने के उद्देष्य से किया गया। संस्थान की किस्मों द्वारा आच्छादित क्षेत्र का अनुमान विभिन्न माध्यमों से किसानों एवं विभिन्न सरकारी और निजी एजेंसियों को दिए गये गुणवत्तायुक्त बीजों की मात्रा के आधार पर लगाया गया। विभिन्न सब्जी फसलों की औसत थोक कीमतें एगमार्कनेट से एकत्र की गई। विष्लेशण से पता चलता है कि वर्श 2021–2022 के दौरान संस्थान की 23 सब्जी फसलों की 62 किस्मों के द्वारा देष में लगभग 133133 हेक्टेयर क्षेत्र आच्छादित था। संस्थान द्वारा विकसित किस्में देष के 27 राज्यों एवं 3 केन्द्र षासित प्रदेषों के 161 जिलों में फैल गई है। वर्श 2021–2022 के दौरान संस्थान द्वारा विकसित किस्मों को अपनाने से सब्जी उत्पादन में लगभग 112.67 हजार टन की अनुमानित वृद्वि हुई एवं कुल आय में अनुमानित वृद्वि लगभग रू. 239.41 करोड़ की हुई। कुल आय वृद्वि में टमाटर का सर्वाधिक योगदान था उसके बाद क्रमषः मिर्च, बैंगन, लौकी एवं भिन्डी का स्थान था। पिछले कई वर्शों से संस्थान की बीज की मांग और बिक्री बढ़ रही है जो देष में किसानों के बीच संस्थान के किस्मों की बढ़ती लोकप्रियता को दर्षाता है।